Analysis of Factors Affecting the Performance of Government Project Completion Time in Pangkalpinang City

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ABSTRACT

Bangka Belitung Islands Province with its capital city Pangkalpinang has a strategic position as a city located on the economic route of Bangka Island. As an archipelago, it relies heavily on the transportation sector, both land, sea and air transportation to meet construction materials. Astronomically, Pangkalpinang City is located between 2°4'-2°10' South Latitude and 106°4'-106°7' East Longitude. Administratively, Pangkalpinang City is divided into 7 sub-districts, namely Bukit Intan, Girimaya, Taman Sari, Gerunggang, Rangkui, Gabek, and Pangkalbalam Districts with a total area of 118.41 km2. This research is included in the type of quantitative descriptive research using the survey method. The survey method aims to provide a detailed description of the background, characteristics, and characteristics that are typical of a case or incident of something that is general in nature. The purpose of the study was to obtain solutions to the variables that most influence the performance of the completion time of government building construction in Pangkalpinang City. Based on the results of the T-Test analysis, F-Test and Determination Coefficient Test, it was obtained partially and simultaneously that Environmental Factors (X1), Wage Factors (X2), Coordination (X3), and Worker Productivity (X4) have a significant effect and have a contribution of 85.4% to the performance of the completion time of government building construction projects, 2) based on the results of the variable ranking analysis using multiple linear regression equations & beta coefficient values, it can be concluded that the Wage Factor variable (X2) is the dominant factor that influences the performance of the completion time of building construction projects, which is 72.59%, so to control the completion time of government building construction projects which is mainly carried out by the Project Manager is to control Wages, 3) all research variables, namely Environmental Factors (X1), Labor Factors (X2), Coordination (X3), and Worker Productivity Factors (X4) can affect the performance of the completion time of government building construction projects in Pangkalpinang City. The results of the analysis show that the dominant factor according to all respondents is the labor factor (beta value 1.001).

Keywords: environmental factors, wages, productivity, performance, construction projects.

INTRODUCTION

In accordance with the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia [1] concerning the Construction of State Buildings in Chapter I General Provisions Article 1 State Buildings are buildings for official purposes that are state or regional property and are procured with funding sources originating from the APBN, APBD and/or other legitimate acquisitions. In general, a project is a work activity carried out based on a request from an owner or work owner who wants to achieve a certain goal and is carried out by the work implementer in accordance with the wishes of the owner or project owner and existing specifications. In implementing the project, the project owner and project implementer have the rights received and obligations that must be carried out in accordance with the time period that has been mutually agreed upon between the project owner and the project implementer.

Delays in construction projects mean an increase in the time required to complete the project that has been planned and stated in the contract documents. Completion of work not on time is a deficiency in the level of productivity and of course all of this will result in waste in financing, either

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in the form of direct financing spent on government projects, or in the form of investment inflation and losses in private projects.

Project management is a factor that supports the success of a project because it is the arrangement of resources within the limits of scope, time, cost, and quality that have been determined to complete the project. Project management includes project planning, scheduling, and control. In reality, the implementation of construction projects always experiences obstacles that result in delays in completion of work, so that the completion time of the work does not match that which has been stipulated in the work contract documents. Delays will cause losses for related parties, especially owners and contractors, because they are generally accompanied by conflicts, demands for time and costs, and deviations in the quality of project completion. Various methods are used to avoid problems that result in delays and losses [2].

The Bangka Belitung Islands Province with its capital city of Pangkalpinang has a strategic position as a city located on the economic route of Bangka Island. As an archipelago, it relies heavily on the transportation sector, both land, sea and air transportation to meet construction materials. This means that Pangkalpinang City in particular and Bangka Island in general, have a very large dependence on outside the island, namely Palembang and its surroundings and Jakarta to meet the needs of construction materials in the form of cement, iron and other materials. This city also acts as a corridor and center point of development in the Bangka Belitung region. In 2020, the population of Pangkalpinang City reached 236,267 people [3]. Astronomically, Pangkalpinang City is located between 2 ° 4 '-2 ° 10 'South Latitude and 106 ° 4 '-106 ° 7' East Longitude. Administratively, Pangkalpinang City is divided into 7 sub-districts, namely Bukit Intan, Girimaya, Taman Sari, Gerunggang, Rangkui, Gabek, and Pangkalbalam Sub-districts with a total area of 118.41 km^2 [4].

Definition of Construction Project

A project is defined as a series of unique activities that are interdependent to achieve certain results and are completed within a certain period of time. Each project produces a unique product, service, or result that may be goods or services. Project activities can be repeated, but this repetition does not change the characteristics inherent in the project. For example, an office building can be built with the same materials and the same team, but each building in the project remains unique and has a different location, design, condition, etc [5].

Construction Project Management

In the construction implementation stage there are three stages of implementation, namely: the planning stage, the implementation stage and the completion stage, the maintenance stage and the project handover. Project benchmarking always shows that a project when implemented must meet three criteria, namely: 1) does not exceed the previously agreed project cost limit or in accordance with the construction work contract document, 2) the final result of the work must meet the standards according to the mutual agreement and in accordance with the construction work contract document, 3) must complete the work according to the deadline agreed in the construction work contract document.

Construction Project Delays

According [6] delays are part of the implementation time that cannot be utilized optimally, causing several activities to be delayed or even unable to be completed on time according to the planned schedule.

Causes of Construction Project Delays

Conducted a study on construction project delay factors reviewed from three main components, namely: 1) the main factors causing construction project delays related to contractors, especially the flow of funds from contractors, weak management capacity, lack of experience of contractors and sub-contractors, 2) the main factors causing construction project delays related to consultants, namely the completeness and timeliness of project information, accuracy of building design, communication management, work experience, priorities during construction, ignoring some details in the design, and not fully understanding the needs of the project owner, 3) external factors that

cause construction project delays include the authorities (owner/government), applicable regulations, weather conditions, natural disasters, rain, changes in government regulations and legislation, and the impact of land conditions [7].

Environmental Factors

Working as a miner is a culture of the people in Bangka Belitung Province that has been carried out since the time of the sultanate until now. The knowledge about mining that has been obtained for centuries has become their cultural capital to exist as miners until now. This knowledge is then passed on to their descendants. This is what causes the people of Bangka Belitung to rely on their economic life on mining work. Unconventional Mining is also considered a job that can be reached by anyone without requiring special education and skills, so that people are increasingly inseparable from this job. The next impact is the emergence of laziness in the community to look for other jobs so that many workers in the construction labor sector come from outside the region and this will also affect the completion time of construction projects. Because the Bangka Belitung community prefers to work in the mining sector rather than the construction sector.

Mining Factors

According to concerning [8] Mining Areas, Mining is part or all stages of activities in the context of research, management, and exploitation of minerals which include general investigations, exploration, feasibility studies, construction, mining, processing and refining, transportation and sales, and post-mining activities.

Wages

Development is part of a series of changes towards progress in order to realize the prosperity and welfare of the people. The results of development must be enjoyed by all people fairly and evenly, because the success of development depends on the active participation of all people, which means that development must be carried out evenly by all levels of society.

Coordination

Defines "Coordination is the process of integrating goals and activities in separate units (departments or functional areas) of an organization to achieve organizational goals efficiently".

Worker Productivity

Worker productivity is one of the main determining factors in the success of a construction project. This productivity is measured by the relationship between the output produced and the input or resources used, including labor. Labor effectiveness, which refers to how well working time is used for productive activities, is also very important. Activities such as being idle, chatting, eating, smoking, and arriving late can reduce worker productivity.

RESEARCH METHOD

Research location

Currently, the Pangkalpinang City government has completed several government building projects that have diverse functional characteristics and have experienced delays in completion. The following are some of the projects that have been carried out by Pangkal Pinang City from 2021 to 2023.

Pembangunan Gedung Poliklinik RSUD Depati Hamzah Pangkal Pinang (4 lantai)

1. Construction of the Pangkal Pinang Tin Dome Mosque (2 floors)
2. Construction of the Pangkal Pinang City Prosecutor's Office (3 floors)
3. Construction of the Pangkal Pinang City Police Satpas (2 floors)
4. Major Rehabilitation of the Gabek I Village Office Building (non-storeyed)

Type of Research

This research is included in the type of quantitative descriptive research using the survey method. The survey method aims to provide a detailed description of the background, characteristics, and

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characteristics that are typical of a case or incident of something that is general in nature. In addition, to create a systematic, factual and accurate description or picture of the facts, characteristics, and relationships between the phenomena being investigated. The instrument used is a closed method questionnaire. The indicators for the research variables are then described by the author into a number of questions so that primary data is obtained. Quantitative research is developed using systematic models, theories and/or hypotheses [9]-[13].

Research Design

This research process contains the research flow from the beginning to the discovery of the hypothesis to answer the formulation of the problem by conducting scientific research, where in the process there are stages that are adjusted to the research framework that has been prepared in the form of a flow diagram. The flow diagram is prepared based on the formulation and objectives of the research to be achieved.

The following is a research flow chart in Figure 1 below.

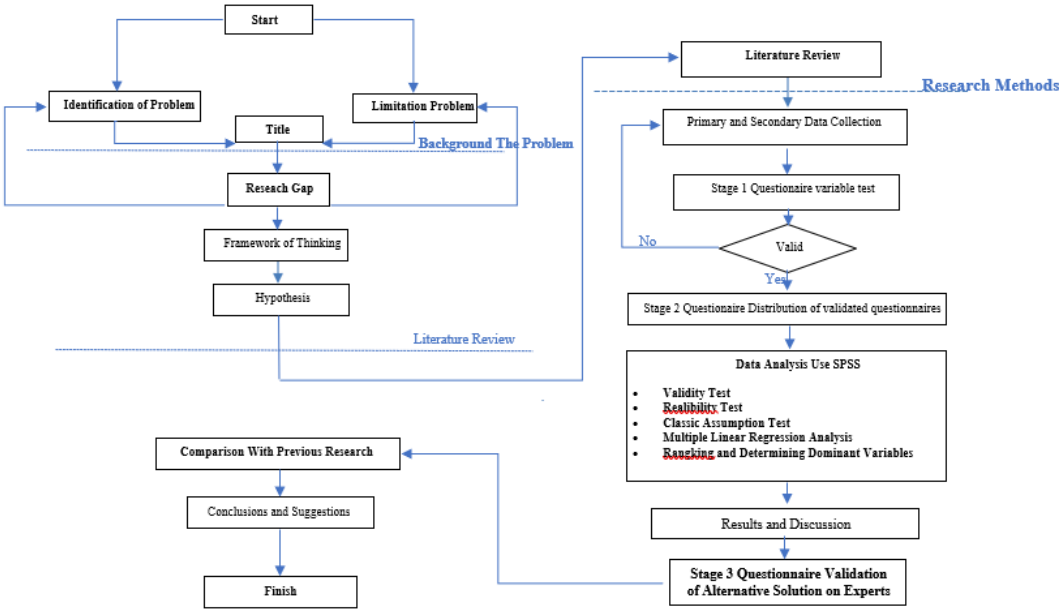

Figure 1. Research flowchart

Population

Population is an equalization area found by phenomena or topics that have specific capacities and characteristics that are determined for researchers to study and then draw conclusions. Population is the totality of each element to be studied that has the same characteristics, it can be an individual from a group, event, or something to be studied. Who states that a sample is part or representative of the population being studied. Population is the entire research subject. If researchers want to study all the elements in the research area, then the research is population research. The population in this study was 50 people consisting of contractors, consultants and supervisors in around 32 government building construction projects in Pangkalpinang City.

Sample

A sample is part of the entire population consisting of a number of elements with the same characteristics. The sample consists of a number of members randomly selected from the population. In other words, not all elements of the population are part of the sample. In this sampling technique, the author uses the "Purposive Sampling" technique, which is a sampling technique with certain considerations. From the definition above, it can facilitate research, the author determines the properties and characteristics used in this study. The sample to be used in this study is the experts

and technical team who play a role in planning building construction work in Pangkalpinang City using the Slovin formula.

The sample selection criteria are divided into inclusion and exclusion criteria. Inclusion criteria are sample criteria desired by researchers based on research objectives, namely contractors, consultants and supervisors who handle or have handled building construction projects in Pangkalpinang City. While exclusion criteria are special criteria that cause prospective respondents who meet the inclusion criteria to be excluded from the research group, namely: craftsmen or project workers, contractors, consultants and suppliers who have never handled building construction projects

Determining the Number of Respondents

In this study, the target respondents needed to fill out the questionnaire consisted of several respondents. The purpose of determining the target respondents was so that the results of the questionnaire were more optimal because they were filled out by professionals in their fields. There were 3 target respondents targeted in this study, namely:

1. Planners, as a role that contributes greatly to the determination and planning of both materials and specifications.
2. Technical Team, as a role that has the authority to make decisions related to the planned project.
3. Contractors, as a role that implements the planning results.

This study uses the Slovin formula because in drawing samples, the number must be representative so that the research results can be generalized and the calculation does not require a sample size table, but can be done with a simple formula and calculation. The Slovin formula for determining the sample is as follows:

n = N / (1 + N(e^2))

Where:

n : Desired sample size

N : Population Size

e : Legitimacy level (in decimal, for example 0.05 for 5%)

To calculate the sample size using the Slovin formula with a leniency level of 5% and a population of 57, here are the steps:

Population size (N): 57

Legislation level (e): 0.05 (5% in decimal) Slovin formula:

n = 57 / (1 + 57(0.05^2)) n = 57 / (1 + 57(0.0025))

n = 49.89

Since the sample size must be an integer, the results are rounded to the nearest higher number: n = 50

Types and Sources of Data

The data taken and collected for this study are primary data and secondary data. Primary data is a data source that directly provides data to data collectors, while secondary data is a data source that does not directly provide data to data collectors, for example through other people or through documents.

Based on the data collection technique, namely through a questionnaire, the types of data in this study are as follows:

1. Primary Data
   Obtained by filling out a questionnaire distributed to stakeholders as research subjects.
2. Secondary Data

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Secondary data is obtained through similar research journals or research that supports the substance of this study, both research journals on stakeholder control factor analysis and other journals.

Research Instrument

A research instrument is a tool chosen and used by researchers in data collection activities so that the presentation can be more systematic. Meanwhile, a research instrument is a tool used to record the state and activity of psychological attributes. So it can be concluded that a research instrument is a tool used by researchers to collect qualitative and quantitative data and information about the variables being studied. Based on the existing literature, the research instrument is as follows:

Table 1. Research Instrument

No	Variable		Indicators	Sources
1.	Environmental Factors (X1)	X1.1	Work experience and education level of the workforce	
		X1.2	Supervision of the workforce	(Nabilah et al, 2021)
		X1.3	Socio-cultural factors of the community	(Lusiana et al, 2016)
		X1.4	Weather factors	(Geovani et al, 2023) (Fuji Lestari et al, 2022)
		X1.5	Mining factors	
2.	Wage Factors (X2)	X2.1	Provision of wages based on expertise and education level	(Andi et al, 2023)
		X2.2	Provision of wages based on length of work	(Andi et al, 2023)
		X2.3	Provision of wages based on work performance	(Andi et al, 2023)
		X2.4	Provision of wages in terms of certain jobs	(Andi et al, 2023)
		X2.5	Provision of incentives	
3.	Coordination (X3)	X3.1	Vertical coordination	(Joshua et al, 2020)
		X3.2	Horizontal coordination	(Joshua et al, 2020)
		X3.3	Coordination between agencies/agency units	(Joshua et al, 2020)
4.	Worker Productivity (X4)	X4.1	Performance of skilled workers on project work	(Joshua et al, 2020)
		X4.2	Number of jobs completed according to target	(Joshua et al, 2020)
		X4.3	Quality of skilled workers on project work	(Joshua et al, 2020)

RESULTS AND DISCUSSION

Data Collection

Data collection in this study was by creating a research questionnaire, researchers looked for influential indicators from journal references and books that had been presented by previous researchers. Data collection from respondents using a google form distributed to stakeholders representing government building infrastructure consisting of academics, consultants, contractors, staff and officials at the PUPR Office of Pangkalpinang City. The type of data used in this study is secondary data from previous journal references to determine the initial research variables and primary data obtained from the results of questionnaires, observations and interviews with respondents.

Table 2. Research Respondents

No	By Position	Based on education	Based on experience
1	Owner/ Director	S1 and S3	Over 20 years
2	Project Manager	S1	16 to 20 years
3	Site Manager	S1	11 to 15 years
4	Supervising Consultant	S2 and S1	5 to 10 years
5	Project Control	S1	5 to 10 years
6	Site Supervisor	Senior High School	5 to 10 years

Questionnaire Stage 1 (Expert Validation)

Data collection at this initial stage involved distributing questionnaires to seven experts related to the construction sector, namely from academics, contractors and consultants, especially building

construction. Based on the results of the expert respondents consisting of 6 men and 1 woman with work experience in the field of civil engineering education.

From the results of the questionnaire stage 1, it can be concluded that there are changes in indicator X1.1. Work experience and education level of the workforce and indicator X1.2. The implementation of supervision of the workforce according to experts is not appropriate if included as an environmental factor variable (X1) it should be included in the worker productivity variable (X4), so with input from experts the results of the indicator changes are as in the following table:

Table 3. Changes in Variables According to Experts

NO	Variable	Indicator	
1	Environmental Factors	X1.1	Work Culture Factors of Pangkalpinang Community in Particular Can Affect the Performance of the Government Building Project Completion Time
		X1.2	Weather Changes During Project Completion Can Affect the Performance of the Government Building Project Completion Time
		X1.3	Mining Factors Can Affect the Performance of the Government Building Project Completion Time Project Completion Because many workers are absorbed in the mining sector
2	Wage Factors	X2.1	By Providing Wages Based on Skills and Education Levels Can Affect the Performance of the Government Building Project Completion Time
		X2.2	Provision of Wages Based on Length of Work Time Can Affect the Performance of the Government Building Project Completion Time
		X2.3	Provision of Wages Based on Work Performance Can Affect the Performance of the Government Building Project Completion Time
		X2.4	Provision of Wages in Certain Jobs Can Affect the Performance of the Government Building Project Completion Time
		X2.5	The Provision of Incentives Can Affect the Performance of the Government Building Project Completion Time
3	Coordination	X3.1	Vertical Coordination Can Affect the Optimization of the Government Building Project Completion Time
		X3.2	Horizontal Coordination Can Affect the Optimization of the Government Building Project Completion Time
		X3.3	Coordination Between Agencies/Agency Units Can Affect the Optimization of the Government Building Project Completion Time
4	Worker Productivity	X4.1	The Performance of Skilled Workers on Project Work Can Affect the Optimization of the Government Building Project Completion Time
		X4.2	The Amount of Work Completed According to Target Can Affect the Optimization of the Completion Time Government Building project
		X4.3	The quality of skilled workers on Project work can affect the optimization of the completion time of the Government Building project
		X4.4	Work experience and education level of workers can affect the optimization of the completion time of the Government Building project
		X4.5	Implementation of supervision of workers can affect the optimization of the completion time of the Government Building project

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NO	Variable	Indicator	
5	Project Completion Performance	Y1	time optimization can affect the performance of the project completion time
		Y2	time optimization can affect the performance of the project completion cost

Next, table 3 is the expert validation result which will then be used in the stage 2 questionnaire to assess the variable indicators that affect the performance of the project completion time.

Stage 2 Questionnaire (Variable Indicator Assessment)

The stage 2 questionnaire is the process of filling in the assessment data on the variables generated from the stage 1 questionnaire data using a Likert scale. The results of this stage 2 questionnaire are primary data in the form of an assessment of variable indicators that affect the performance of the completion time in the implementation of building construction projects in Pangkalpinang City. Based on table 3 above, it is continued by distributing questionnaires to respondents via google form (online) and the answers to the questionnaire can be directly received via the google form response link. The number of respondents required according to the sample calculation in chapter III using the Slovin formula is 50 people. In the questionnaire distributed to the selected respondents, the respondents will answer by choosing the answers provided on a scale of 1 to 5, from varying answer criteria. The scale is designed in such a way that scale 1 is the least expected answer option and scale 5 is the most expected answer option.

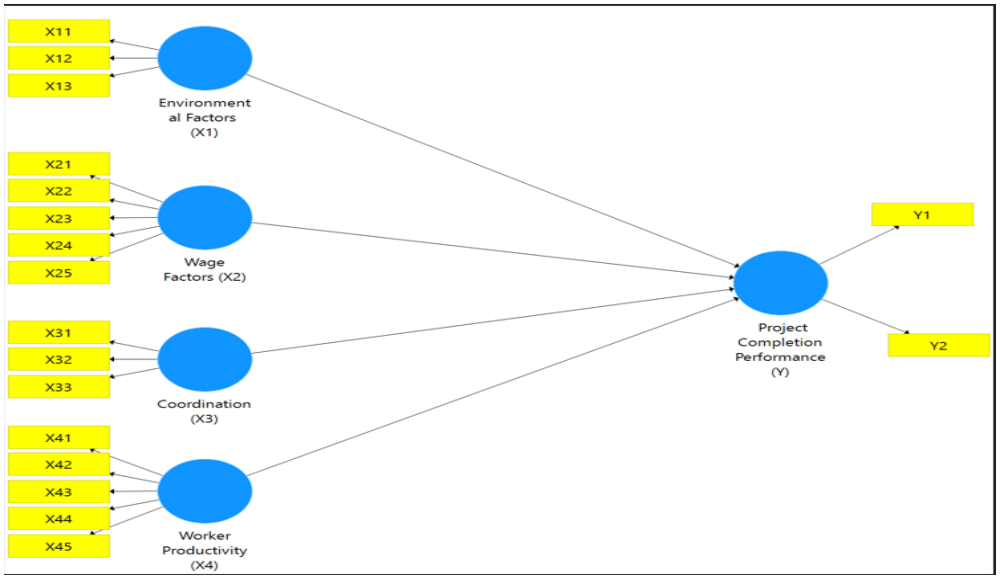

Figure 2. Relationship between Variable X and Variable Y Source: Researcher Processing (2025)

The figure above shows that the relationship between variable X and variable Y is multiple linear regression. The multiple linear regression equation is:
$Y = \alpha + b1X1 + b2X2 + b3X3 + ….. + \beta nXn + e$
Where:
Y: Dependent Variable
α: Intercept (constant value)
X1, X2, X3, ..., Xn: Independent Variable
b1, b2, b3, ..., bn: Regression Direction Coefficient Value on Independent Variable
e: Standard Error

Respondent Overview

The researcher provided several questions in the questionnaire that could provide information about the respondent profile. The respondent profile from a total of 50 samples was grouped into 3 (three) groups based on job title, work experience (in years) & last education.
The respondents were categorized into 3 (three) groups with the percentage of each group as seen below:

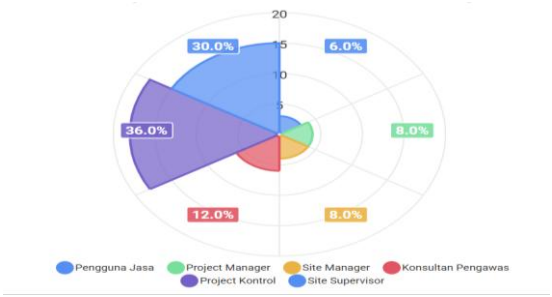

Figure 3. Composition Based on Job Position Source: Researcher Processing (2025)

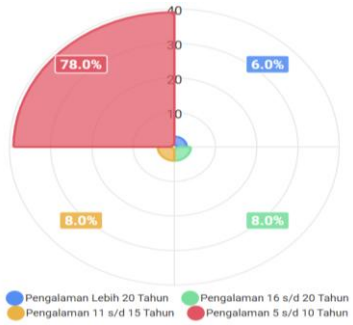

Figure 4. Composition Based on Work Experience Source: Researcher Processing (2025)

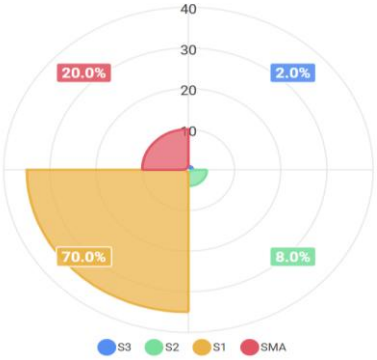

Figure 5. Composition Based on Last Education Source: Researcher Processing (2025)

Data Analysis

Based on the data obtained from respondents through questionnaires, the next stage is to analyze the data using statistical methods. Before conducting multiple linear regression analysis & obtaining dominant factors that can affect the performance of government building construction project completion time, it is necessary to first conduct variable testing in order to obtain good research variables, the following is a description of the tests that will be carried out in this study:

1. Validity Test,
2. Reliability Test,
3. Classical Assumption Test.
4. Multiple Linear Regression Analysis,
5. Ranking & Determination of Dominant Variables.

The number of questionnaires distributed online was 50 respondents and that was more than the minimum number of respondents, to anticipate that the respondent data received back could not reach 100% or the data could not be used as a reference for one reason or another after the normality test with SPSS. The next step is to enter the research results in the form of a level of agreement with the statements that are in accordance with the respondents' opinions, using a Likert scale, according to the weight of the values in the table column that has been provided. The description of the weight of the values given in this section is as follows:

1 = Strongly Disagree (STS)
2 = Disagree (TS)
3 = Less Agree (KS)
4 = Agree (S)
5 = Strongly Agree (SS)
The values above are entered into a tabulation of questionnaire data results in Excel and then transferred to SPSS. This is done to analyze the data and to obtain dominant factors that can affect the performance of project completion time in the implementation of government building construction.

Validity Test

In this study, a validity test was carried out with H_0: $\rho \leq 0$ (invalid statement items) and H_0: $\rho > 0$ (valid statement items) and the test results were obtained with all r values > rtable (with df = 50 - 2 = 48 and a significance of 5%, which is 0.284) so that it can be concluded that all statement items are valid. Next, the reliability test is done by looking at the Cronbach Alpha value. A latent variable is said to be reliable if the Cronbach Alpha value is > 0.7. Information was obtained that all variables have a Cronbach Alpha value > 0.7, which means that all variables are very reliable. The following are the results of the validity test conducted on 50 respondents.

Table 4. Results of the Validity Test for Variable X1

Indicator Code	Testing	Number of Calculations	Based on r-calculated Value (Pearson Correlation)	Based on Sig Value
X1.1	Pearson Correlation Sig. (2-tailed)	1.000 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X1.2	Pearson Correlation Sig. (2-tailed)	0.557 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X1.3	Pearson Correlation Sig. (2-tailed)	0.623 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid

Source: Processed from Research Survey Data (2025)

Table 5. Results of Validity Test of Variable X2

Indicator Code	Testing	Number of Calculations	Based on r-calculated Value (Pearson Correlation)	Based on Sig Value
X2.1	Pearson Correlation Sig. (2-tailed)	1.000 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X2.2	Pearson Correlation Sig. (2-tailed)	0.477 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X2.3	Pearson Correlation Sig. (2-tailed)	0.527 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X2.4	Pearson Correlation Sig. (2-tailed)	0.545 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X2.5	Pearson Correlation Sig. (2-tailed)	0.441 0.001	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid

Source: Processed from Research Survey Data (2025)

Table 6. Results of Validity Test of Variable X3

Indicator Code	Testing	Number of Calculations	Based on r-calculated Value (Pearson Correlation)	Based on Sig Value
X3.1	Pearson Correlation Sig. (2-tailed)	1.000 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X3.2	Pearson Correlation Sig. (2-tailed)	0.455 0.001	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X3.3	Pearson Correlation Sig. (2-tailed)	0.556 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid

Source: Processed from Research Survey Data (2025)

Table 7. Results of Validity Test of Variable X4

Indicator Code	Testing	Number of Calculations	Based on r-calculated Value (Pearson Correlation)	Based on Sig Value
X4.1	Pearson Correlation Sig. (2-tailed)	1.000 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X4.2	Pearson Correlation Sig. (2-tailed)	0.342 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X4.3	Pearson Correlation Sig. (2-tailed)	0.711 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X4.4	Pearson Correlation Sig. (2-tailed)	0.485 0.003	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
X4.5	Pearson Correlation Sig. (2-tailed)	0.349 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid

Source: Processed from Research Survey Data (2025)

Table 8. Results of Validity Test of Variable Y

Indicator Code	Testing	Number of Calculations	Based on r-calculated Value (Pearson Correlation)	Based on Sig Value
Y1	Pearson Correlation Sig. (2-tailed)	1.000 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid
Y2	Pearson Correlation Sig. (2-tailed)	0.567 0.000	> 0.279, Valid	Sig. (2-tailed) < 0.05 and Positive Pearson Correlation, Means the Questionnaire Results are Valid

Source: Processed from Research Survey Data (2025)

Multiple Linear Regression Analysis

According to [15], multiple linear regression analysis is used to determine the direction and influence of independent variables on dependent variables. The stages of testing multiple regression analysis in this study are as follows.

T Test Analysis

The T test is used to test the level of significance of the influence of each independent variable (Xi) on the dependent variable Y separately. Based on the Sig value in the table, a test is carried out on the influence of each Environmental Factor (X1), Wage Factor (X2), Coordination (X3), Worker Productivity (X4) on Completion Time Performance (Y).
The T test calculation is carried out with df = n - k, where n = number of questionnaire respondents and k is the number of variables, then df = 50 - 5 = 45, with a Sig value. 0.05, the T table value is 1.679. The following are the results of the T Test in this study:

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Table 9. T Test Coefficientsa Table

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0,233	0,574		0,407	0,686
	Environmental_Factors	-0,068	0,053	-0,112	-1,297	0,201
	Wage_Factors	0,352	0,056	0,789	6,322	0,000
	Coordination	-0,273	0,094	-0,361	-2,917	0,006
	Worker_Productivity	0,250	0,044	0,586	5,705	0,000

a. Dependent Variable: Project Completion Time

Source: Processed from Research Survey Result Data (2025)

1. In the Environmental Factor variable (X1), the calculated T value = -1.297 < t table 1.679 with a significance of 0.201 > 0.05. So Ha is rejected and H0 is accepted, meaning that So Ha is rejected and H0 is accepted, meaning that the Environmental Factor (X1) has no significant effect on project completion time performance (Y).
2. In the Wage Factor variable (X2), the calculated T value = 6.322 > t table 1.679 with a significance of 0.000 < 0.05. So Ha is accepted and H0 is rejected, meaning that the Wage Factor (X2) has a significant effect on project completion time performance (Y).
3. In the Coordination variable (X3), the calculated T value = -2.917 < t table 1.679 with a significance of 0.006 > 0.05. So Ha is rejected and H0 is accepted, meaning that the Coordination Factor (X3) has no significant effect on project completion time performance (Y).
4. In the Worker Productivity variable (X4), the calculated T value = 2.953> t table 1.679 with a significance of 0.000 <0.05. So Ha is accepted and H0 is rejected, meaning that Worker Productivity (X4) has a significant effect on project completion time performance (Y).

F Test Analysis

The F test aims to measure the significance of all estimated regression equations. The F test calculation determines N2 using the formula N2 = n - k, where n is the number of questionnaire respondents and k is the number of variables used, then N2 = 50 - 5 = 45, while for N1 = k - 1, then N1 = 5 - 1 = 4, with a Sig. value of 0.05, the F Table value is 2.579. The following are the results of the F Test analysis in this study:

Table 10. ANOVAa Table F Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	81.823	4	20.456	65.951	.000[b]
	Residual	13.957	45	0.310		
	Total	95.780	49			

a. Dependent Variable: Project Completion Time
b. Predictors: (Constant), Environmental_Factors, Wage_Factors, Coordination, Worker_Productivity

Source: Processed from Research Survey Result Data (2025)

Based on the table above, it can be seen that the calculated F value = 65.951> F table 2.579 with a significance value of 0.000 <0.05. So Ha is accepted and HO is rejected, meaning that, together, Environmental Factors (X1), Wage Factors (X2), Coordination (X3), & Work Productivity (X4) have a significant effect on Project Completion Time Performance (Y). We can also conclude that the regression equation is good (goodness of fit) and its predicted value can explain the actual situation.

Multiple Linear Regression Equation

Conceptually, regression analysis is a simple method for testing the relationship between variables. The relationship between the variables of interest is described in the form of an equation or model that connects the dependent variable (Y) and one or more independent variables (X).

Table 11. Coefficientsa Table of Multiple Linear Regression Equation

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0,233	0,574		0,407	0,686
	Environmental_Factors	-0,068	0,053	-0,112	-1,297	0,201
	Wage_Factors	0,352	0,056	0,789	6,322	0,000
	Coordination	-0,273	0,094	-0,361	-2,917	0,006
	Worker_Productivity	0,250	0,044	0,586	5,705	0,000

a. Dependent Variable: Project Completion Time

Source: Processed from Research Survey Result Data (2025)

Based on the Unstandardized Coefficients column B value in Table 4.21 above, the multiple linear regression equation can be written as follows:

Y = 0.233 - 0.068 X1 + 0.352 X2 - 0.273 X3 + 0.250 X4

The equation explains that:

1. The Constant value (a) has a positive value of 0.233, the positive sign here means that it shows a unidirectional influence between the independent variable and the dependent variable. This shows that if all independent variables including Environmental Factors (X1), Wage Factors (X2), Coordination (X3) and Worker Productivity (X4) have a value of 0% (percent) or do not change, then the project completion time value is 0.233.
2. The regression coefficient value for the environmental factor variable (X1) is -0.068. The value shows a negative influence (opposite direction) between environmental variables and government project completion time. This means that if the environmental factor variable increases by 1, then conversely the project completion time will decrease (project implementation time increases) by 0.068 assuming that other variables are considered constant.
3. The regression coefficient value for the wage factor variable (X2) is 0.352. This value shows a positive influence between the wage variable and government project completion time assuming that other variables are considered constant. This means that if the wage factor variable increases by 1, then the project completion time will be faster (project implementation time is reduced) by 0.068, a positive sign means that it shows a unidirectional influence between the independent variable and the dependent variable.
4. The regression coefficient value for the coordination factor variable (X3) is -0.273. This value shows a negative influence (opposite direction) between the coordination variable and government project completion time. This means that if the coordination variable increases by 1, then conversely the project completion time will decrease (project implementation time increases) by 0.273, assuming that other variables are considered constant.
5. The regression coefficient value for the worker productivity factor variable (X4) is 0.250. This value shows a positive influence between the worker productivity variable and the government project completion time assuming that other variables are considered constant. This means that if the worker productivity variable increases by 1, then the project completion time will be faster (project implementation time decreases) by 0.250, a positive sign means that it shows a unidirectional influence between the independent variable and the dependent variable.
6. Environmental Factors (X1), Wage Factors (X2), Coordination (X3) and Worker Productivity (X4) increase by 1, then the Project Completion Time Value (Y) that occurs is 0.233 - 0.068 + 0.352 - 0.273 + 0.250.

Ranking and Determination of Dominant Variables

According to [16], the dominance variable test is used to determine how much influence the independent variable has on the dependent variable. Use the beta coefficient (Beta Coefficient) to determine which independent variable has the greatest influence (dominates) on the value of the dependent variable.

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Table 12. Ranking of Dominant Variables

No	Research variables	Beta standarized	Zero-order	Beta Standarized xZero-order	% Dominant
1	Environmental Factors (X1)	-0,143	0,478	-0,068	-6,84%
2	Wage Factors (X2)	0,856	0,848	0,726	72,59%
3	Coordination Factors (X3)	-0,427	0,645	-0,275	-27,54%
4	Worker Productivity (X4)	0,592	0,830	0,491	49,14%
a. Dependent Variable: Project Completion Time			∑	0,873	87,35%

Source: Processed from Research Survey Result Data (2025)

Variable Indicator Ranking

After obtaining the dominant % value between variables, an assessment of the percentage influence of each variable indicator on the completion time of government building construction can be carried out using the formula:

$Index\ Xn.n$

Variable Indicator Percentage Value = $Index \sum Xn\ x$ Variable Percentage Value Xn

With a detailed description of the calculation as follows:

Table 13. Variable Indicator Assessment

No	Variable	Indicator	Xn.n	Total Xn	% Dominant Variable Xn	% Dominant Indicator Variable
1	Environmental Factors (X1)	X1.1	203	599	18,20%	6,17%
2		X1.2	195			5,93%
3		X1.3	201			6,11%
	Total % Dominant Variable (X1)					18,20%
1	Wage Factors (X2)	X2.1	211	1028	31,24%	6,41%
2		X2.2	206			6,26%
3		X2.3	205			6,23%
4		X2.4	204			6,20%
5		X2.5	202			6,14%
	Total % Dominant Variable (X2)					31,24%
1	Coordination Factors (X3)	X3.1	213	630	19,14%	6,47%
2		X3.2	213			6,47%
3		X3.3	204			6,20%
	Total % Dominant Variable (X3)					19,14%
1	Worker Productivity (X4)	X4.1	216	1034	31,42%	6,56%
2		X4.2	211			6,41%
3		X4.3	212			6,44%
4		X4.4	190			5,77%
5		X4.5	205			6,23%
	Total % Dominan Variabel (X4)					31,42%

Source: Processed from Research Survey Result Data (2025)

Based on the analysis, the ranking of variable indicators that influence project completion time performance in government building construction projects is obtained, namely as follows:

Table 14. Ranking of Dominant Variable Indicators

Ranking	Indicator	% Dominant Indicator Variable	Indicator
1	X4.1	6,56%	The performance of skilled workers on project work can affect the project completion time
2	X3.1	6,47%	Poor vertical coordination can affect the project completion time
3	X3.2	6,47%	Lack of horizontal coordination can affect the project completion time
4	X4.3	6,44%	The quality of skilled workers on project work can affect the performance of project completion
5	X2.1	6,41%	By providing wages based on expertise and education level can affect the project completion time
6	X4.2	6,41%	The amount of work completed according to target can affect the project completion time

Ranking	Indicator	% Dominant Indicator Variable	Indicator
7	X2.2	6,26%	Provision of wages based on length of work time can affect the project completion time
8	X2.3	6,23%	Provision of wages based on work performance can affect the project completion time
9	X4.5	6,23%	Implementation of supervision of workers can affect the project completion time
10	X2.4	6,20%	Provision of wages in terms of certain jobs can affect the project completion time
11	X3.3	6,20%	Lack of coordination between agencies/agency units can affect the project completion time
12	X1.1	6,17%	Socio-cultural factors of the Pangkalpinang community in particular can affect project completion performance
13	X2.5	6,14%	The provision of incentives can affect the project completion time
14	X1.3	6,11%	Mining factors can affect the performance of project completion time because many workers are absorbed in the mining sector
15	X1.2	5,93%	The occurrence of bad weather during project implementation can affect the performance of project completion

Ranking	Indicator	% Dominant Indicator Variable	Indicator
1	X4.1	6,56%	The performance of less skilled workers on project work can affect the project completion time
2	X3.1	6,47%	Poor vertical coordination can affect the project completion time
3	X3.2	6,47%	Lack of horizontal coordination can affect the project completion time
4	X4.3	6,44%	The quality of skilled workers on project work can affect the performance of project completion.
5	X2.1	6,41%	By providing wages based on expertise and education level can affect the project completion time
6	X4.2	6,41%	The amount of work completed according to target can affect the project completion time
7	X2.2	6,26%	Provision of wages based on length of work time can affect the project completion time
8	X2.3	6,23%	Provision of wages based on work performance can affect the project completion time
9	X4.5	6,23%	Provision of wages in terms of certain jobs can affect the project completion time
10	X2.4	6,20%	Mining Factors Can Affect the performance of project completion time because many workers are absorbed in the mining sector

Ranking	Indicator	% Dominant Indicator Variable	Indicator
11	X3.3	6,20%	Lack of coordination between agencies/institutional units can affect project completion time
12	X1.1	6,17%	Socio-cultural factors of Pangkalpinang society in particular can affect project completion performance
13	X2.5	6,14%	The provision of incentives can affect project completion time
14	X1.3	6,11%	Mining factors can affect project completion time performance because many workers are absorbed in the mining sector
15	X1.2	5,93%	Bad weather during project implementation can affect project completion performance
16	X4.4	5,77%	Work experience and education level of workers can affect project completion performance

Source: Processed from Research Survey Result Data (2025)

Research Findings

The research that has been conducted states that all research variables, namely Environmental Factors (X1), Labor Factors (X2), Coordination (X3), and Worker Productivity Factors (X4) can affect the performance of the completion time of government building construction projects in Pangkalpinang City. This is almost in line with previous research [17] entitled "Inhibiting Factors That Influence the Performance of Building Construction Implementation Time" which observed the performance of the implementation time on the UPT Vertical Kupang Hospital building project and effective ways to overcome obstacles that occur, The results of the analysis show that the dominant factor according to all respondents is the labor factor (beta value 1.001), according to the contractor, namely the request for changes to work that has been completed, high rainfall and stormy winds, according to the supervising consultant, namely labor strikes, limited use of technology and

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the length of equipment delivery and also according to the owner, namely labor strikes. The difference between this study and the study conducted by [17] is that this study adds environmental factor variables (X1) and Coordination (X3) which have been proven to affect the performance of completion time in government building construction projects.

Environmental Factors

The environmental factor variables in this study consist of three indicators including work culture factors, bad weather and mining factors. The environmental variables taken by the researcher in this case affect the completion time of the project work. In terms of work culture, especially for the Bangka Belitung community, they rely on their economic life on mining work. Unconventional Mining is also considered a job that can be reached by anyone without requiring special education and skills, so that people are increasingly inseparable from this job. The next impact is the emergence of laziness in the community to look for other jobs so that many workers in the construction labor sector come from outside the area and this will also affect the completion time of the construction project. Then in terms of weather, the Pangkalpinang area is an island area where many building materials are brought in from outside the Pangkalpinang area so that if bad weather occurs it will affect the performance of the project completion time. Environmental factors can affect the performance of time on construction projects, this is evidenced by findings from field observations, discussions with related stakeholders & research results. The following are alternative solutions that can be applied to government building construction projects.

Table 15. Discussion of Alternative Solutions Variable X1

No	Code Indicator	Variable Indicator	Alternative Solution
1	X1.1	Work Culture Factors Can Affect Project Completion Time Performance	In terms of recruiting workers, it is better to recruit workers from outside who have certain skills so that they do not depend on local workers, so that the shortage of local workers is anticipated from the start of the project. and this is not an obstacle or can increase costs and project completion times that are not in accordance with the contract.
2	X1.2	Bad Weather Occurrence During Project Completion Can Affect Project Completion Time Performance	• For construction, renovation, or projects that allow, try to get the team to shift their focus to work that is indoors or in areas protected from bad weather, so that they remain productive even though outside conditions do not allow. • Adjusting the work schedule to weather conditions is very important. A flexible schedule allows for adjustments to when work can be done and when it must be stopped due to bad weather. For example, if heavy rain is predicted, outdoor work can be moved to a protected area or indoor work can be prioritized
3	X1.3	Mining Factors Can Affect Project Completion Time Performance Because many workers are absorbed in the mining sector	• If local workers are largely absorbed by the mining sector, the company can consider recruiting workers from outside the area or using outsourcing to meet project needs. This will help cover the shortage of workers without having to rely entirely on the mining sector. • To prevent workers from being diverted to the mining sector, providing attractive incentives or compensation can be a solution. For example, increasing salaries or offering bonuses to workers who are committed to completing projects within the specified time.

Source: Discussion Results with Government Building Construction Project Stakeholders (2024)

Correlations

		Environmental_Factors	Wage_Factors	Coordination	Worker_Productivity	TOTAL_Y
Environmental_Factors	Pearson Correlation	1	.544**	.629**	.721**	.512**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	50	50	50	50	50
Wage_Factors	Pearson Correlation	.544**	1	.868**	.741**	.848**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	50	50	50	50	50
Coordination	Pearson Correlation	.629**	.868**	1	.719**	.675**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	50	50	50	50	50
Worker_Productivity	Pearson Correlation	.721**	.741**	.719**	1	.830**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	50	50	50	50	50
TOTAL_Y	Pearson Correlation	.512**	.848**	.675**	.830**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 12. Correlation Between Variables

Based on Figure 12 above, we can draw conclusions about the relationship between variables in the **Pearson bivariate correlation analysis.**

1. Based on the Sig. (2-tailed) significance value: From the output table above, the sig. (2-tailed) value between the Environmental Factor (X1), Wage Factor (X2), Coordination (X3) and Worker Productivity (X4) variables is 0.000, which means that there is a significant correlation between these variables.
2. Based on the calculated r value (Pearson Correlations): It is known that the calculated r value for the relationship between the Environmental Factor (X1) and the Wage Factor (X2) is 0.544> r table 0.279, so it can be concluded that there is a relationship or correlation between the Environmental Factor (X1) and the Wage Factor (X2) variables. Furthermore, it is known that the calculated r value for the relationship between the Environmental Factor variable (X1) and the coordination variable (X3) is 0.629> r table 0.279, so it can be concluded that there is a relationship or correlation between the Environmental Factor variable (X1) and the coordination variable (X3). Furthermore, it is known that the calculated r value for the relationship between the Environmental Factor variable (X1) and the worker productivity variable (X4) is 0.721> r table 0.279, so it can be concluded that there is a relationship or correlation between the Environmental Factor variable (X1) and the worker productivity variable (X4). Because the calculated r or Pearson Correlations in this analysis is positive, it means that the relationship between the three variables is positive or in other words, the increasing environmental factors will also increase the wage, coordination and worker productivity factors.
3. It is known that the calculated r value for the relationship between the Wage Factor (X2) and Coordination (X3) is 0.868> r table 0.279, so it can be concluded that there is a relationship or correlation between the Wage Factor variable (X2) and Coordination (X3). Furthermore, it is known that the calculated r value for the relationship between the Wage Factor variable (X2) and the Worker Productivity variable (X4) is 0.741> r table 0.279, so it can be concluded that there is a relationship or correlation between the Wage Factor variable (X2) and the Worker Productivity variable (X4). Because the calculated r or Pearson Correlations in this analysis is positive, it means that the relationship between the two variables is positive or in other words, the increasing Wage factor will also increase the Coordination factor and worker productivity.
4. It is known that the calculated r value for Coordination (X3) with Worker Productivity (X4) is 0.719> r table 0.279, so it can be concluded that there is a relationship or correlation between the Coordination variable (X3) and Worker Productivity (X4). Because the calculated r or Pearson Correlations in this analysis is positive, it means that the relationship between the two

variables is positive or in other words, the increasing Coordination factor will also increase worker productivity.

Wage Factor

This study supports other research conducted by [17], that the wage factor has an influence on the performance of construction project implementation time. The wage factor can affect time performance on construction projects, this is evidenced by findings from field observations, discussions with related stakeholders & research results. The following are alternative solutions that can be applied to government building construction projects.

Table 16. Discussion of Alternative Solutions for Variable X2

No	Code Indicator	Variable Indicator	Alternative Solution
1	X2.1	By providing wages based on expertise and education level can affect the performance of project completion time	• Setting higher wages for workers with higher skills or education can increase their motivation to work faster and more efficiently. Workers who feel valued for their skills are more likely to be committed and focused on completing projects well. • Creating a skill-based wage structure allows companies to allocate human resources according to the complexity of tasks. Workers with higher skills can be given greater responsibility or more complex work, while workers with lower skills can be given simpler tasks.
2	X2.2	Provision of wages based on length of time worked can affect the performance of project completion time	• Avoid providing incentives based on work time that are unrealistic or not in accordance with the worker's capacity. Wages should be enough to attract workers without encouraging them to work too much or too little, which can lead to imbalances in productivity. • Remuneration can be combined with a performance system, which encourages workers to complete their tasks faster without sacrificing quality. This system can provide bonuses or incentives for completing work ahead of schedule, or for achieving certain targets..
3	X2.3	Provision of wages based on work performance can affect the performance of project completion time	To ensure that performance-based remuneration can affect project completion time performance, it is important to have clear and measurable performance criteria. These criteria can be in the form of achieving work targets, quality of work results, or speed of completing tasks according to specified standards.
4	X2.4	Provision of wages in terms of certain jobs can affect the performance of project completion time	• Set higher wages for more complex jobs or jobs that require special skills. For example, jobs that require technical expertise or rarer skills can get higher compensation. This can motivate workers to focus on more challenging and important work. • For example, in a tin dome mosque, calligraphy ornament interior workers are needed, so they should be given different wages from other jobs because this is special.
5	X2.5	The provision of incentives can affect the performance of project completion time	Provide greater incentives for workers or teams who succeed in completing work faster than scheduled, but still with good quality. This incentive can be in the form of a financial bonus or other form of recognition. The right incentives encourage them to complete tasks faster, reduce wasted time, and achieve targets more efficiently. This, in turn, will speed up the overall project completion time

Source: Discussion Results with Government Building Construction Project Stakeholders (2024)

Coordination

Coordination factors can affect time performance on construction projects, this is evidenced by findings from field observations, discussions with related stakeholders & research results. The following are alternative solutions that can be applied to government building construction projects.

Table 17. Discussion of Alternative Solutions Variable X3

No	Code Indicator	Variable Indicator	Alternative Solution
1	X3.1	Poor vertical coordination can affect project completion time performance	• Create structured procedures so that everyone knows who is responsible for what and when. • Implement project management software that facilitates coordination between teams, such as real-time progress tracking, planning, and scheduling tools.

2	X3.2	Lack of horizontal coordination can affect project completion time performance	• Periodically evaluate how coordination between teams is going, and immediately address any coordination issues that arise to prevent further delays. • Use project management software that allows each team to see the progress of other teams' work, share updates, and track deadlines. This tool can help teams work more synchronously and avoid mistakes that occur due to ignorance of other teams' work • Between the foreman, the foreman and the workers in translating the existing work plan to coordinate with the supervising consultant at each stage of the work, that's what happened in the construction of the gabek and sarpas polresta
3	X3.3	Lack of coordination between agencies/agency units can affect project completion time performance	• Establish a special team consisting of representatives from each agency involved in the project. This team will be responsible for maintaining smooth communication, resolving problems that arise, and ensuring that decisions are made in accordance with the needs of all parties. • Example in the mosque, coordination with the mosque council regarding the toilet problem was delivered late so that the decision affected the time • Instructions for adding a wakajari room by the agency were also delivered late so that regular meetings were held so that the work stages were not disrupted

Source: Discussion Results with Government Building Construction Project Stakeholders (2024)

Worker Productivity Discussion

Worker productivity factors can affect time performance on construction projects, this is evidenced by findings from field observations, discussions with related stakeholders & research results. The following are alternative solutions that can be applied to government building construction projects.

Table 18. Discussion of Alternative Solutions Variable X4

No	Code Indicator	Variable Indicator	Alternative Solution
1	X4.1	Performance of skilled workers on project work can affect project completion time performance	• Create a realistic and well-structured work schedule, and ensure that skilled workers are assigned tasks that match their expertise. This also includes ensuring that they are not burdened with excessive work. • For special work, it must be ensured that specialist workers install the enamel on the walls of the tin dome mosque, skilled workers are indeed required
2	X4.2	The amount of work completed according to target can affect project completion time performance	• Create a detailed project plan with a realistic schedule, including breaking down tasks into smaller milestones or stages. Make sure each job has a clear and measurable deadline. • All work must be carried out referring to the time schedule, for example how many people and how much material is delivered in 1 working day must be in accordance with the time schedule and can also be assisted by the BIM application
3	X4.3	The quality of skilled workers on project work can affect project completion time performance	Provide training and certification that is continuously updated to workers so that their skills are always relevant to project needs. This training not only includes technical skills, but also additional skills such as work safety, communication, and collaboration.
4	X4.4	Work experience and education level of workers can affect project completion performance	Assign workers to positions or tasks that match their experience and level of education. Workers with more experience or higher education can be given more complex tasks, while less experienced workers can be given simpler tasks to ensure the quality of work.
5	X4.5	Implementation of supervision of workers can affect project completion time performance	• All supervisors should have a construction expertise certificate to understand the proper construction supervision procedures. • The planning consultant must issue an RKS/Work Plan & Requirements as a reference for field supervisors in carrying out work supervision methods.

Source: Discussion Results with Government Building Construction Project Stakeholders (2024)

Discussion of the Most Dominant Variable (X2) Wage Factor

Based on the research results, it was found that the most dominant factor influencing the optimization of the completion time of government building construction projects is the Wage factor. Based on interviews with relevant stakeholders & field observations, on several indicators that influence the performance of project completion time, with the following descriptions:

Provision of wages based on expertise and education level (X2.1)

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In providing wages, contractors must refer to the Regional Minimum Wage (UMR) or now better known as the minimum wage. Where the minimum wage is divided into two, namely the Provincial Minimum Wage (UMP) and the Regency/City Minimum Wage (UMK), and it should also be noted that in determining wages for workers with a work period of less than 1 year in a company, the minimum wage provisions apply. Meanwhile, for workers with a work period of one year/more, the instrument used as a guideline for employers in determining wages is the wage structure and scale, which must be prepared by employers by considering the company's capabilities and productivity. The preparation of the wage structure and scale is intended as a guideline for determining wages so that there is certainty of wages for each worker and to reduce the gap between the lowest and highest wages in the company concerned.

In, Article 92 of the Manpower Law has been amended by Article 81 number 33 of the Job Creation Perppu, so that it becomes:

1. Employers are required to prepare the wage structure and scale in the company by taking into account the company's capabilities and productivity.
2. The wage structure and scale are used as a guideline for employers in determining wages.
3. Further provisions regarding the wage structure and scale are regulated in government regulations.

Wages are given based on the length of time worked (X2.2)

The length of work or the amount of hours worked by this workforce can be measured from the amount of time devoted by a person to work in order to produce goods and services. The workforce receives compensation in the form of wages that have been determined by the company, but usually wages can increase depending on the length of time a person has worked continuously in the company. In this case, a person's wages can increase if the worker becomes a permanent employee and for a long period of time.

Length of work indicates how long a person works at each job or position [18]-[21]. The intensity of labor devoted by a person to his work is influenced by the level of wages to be obtained from the job, this is explained theoretically that "the higher the wages that reach a certain point, the greater the length of work that a person is willing to devote. Therefore, the relationship between length of work and wages will be positive because the longer a person devotes time to work until a certain point, the greater the output produced. In other words, the wages received by workers will later increase.

Avoid providing incentives based on unrealistic working hours or those that do not match the worker's capacity. Wages must be sufficient to attract workers without encouraging them to work too much or too little, which can cause an imbalance in productivity.

Wages can be combined with a performance system, which encourages workers to complete their tasks faster without sacrificing quality. This system can provide bonuses or incentives for completing work ahead of schedule, or for achieving certain targets.

Wages based on work performance (X2.3)

Contractors must have clear and measurable performance criteria. These criteria can be in the form of achieving work targets, quality of work results, or speed of completing tasks according to specified standards, so that workers can assess their work targets if they want to achieve work performance.

Remuneration in terms of certain jobs (X2.4)

Set higher wages for jobs that are more complex or require special skills. For example, jobs that require technical expertise or rarer skills can get higher compensation. This can motivate workers to focus on more challenging and important work.
For example, in a tin dome mosque, calligraphy ornament interior workers are needed, so they should be given different wages from other jobs because this is special

The provision of incentives (X2.5)

It shows that employee performance assessment is an absolute requirement that must be carried out by management so that merit pay can be implemented properly, because the general assumption in business is that merit pay is a payer rewards to employees with high performance and incentives for continued good performance [22]-[25].

Incentives with a merit system are an approach used by organizations or companies to provide awards or incentives based on individual performance and achievements. This merit system assesses employees based on their achievements, abilities, and contributions made in their work, not just based on length of service or other factors [26]-[28].

Here are some important points about incentives with a merit system:

1. Performance-Based Assessment
   In a merit system, incentives are given to employees who demonstrate extraordinary performance. This can include achieving targets, innovations made, increasing work efficiency, or contributions that significantly support company goals. This assessment is usually based on objective and measurable evaluations.
2. Incentives Based on Results, Not Seniority
   Unlike systems that provide incentives based on length of service (seniority), the merit system emphasizes that employees who perform better deserve more awards. This encourages employees to work harder and improve the quality of their work.
3. Forms of Incentives
   Incentives in a merit system can vary, such as:
   a. Bonus or Allowance: Giving additional money based on certain achievements.
   b. Promotion or Job Increase: Providing opportunities for promotion for employees who demonstrate abilities and achievements.
   c. Non-Material Rewards: Recognition or awards in the form of charters or certificates that appreciate employee contributions.
   d. Career Development Opportunities: Providing opportunities to take training or courses to improve skills.

Transparency and Objectivity

One of the keys to the success of a merit system is transparency in the assessment process. Assessments must be objective and based on clear indicators so that employees feel that the incentives given are fair and in accordance with their performance.

Motivation to Improve Performance

This system aims to motivate employees to continue to improve their performance. Because incentives are given based on achievement, this can encourage healthy competition among employees and help the company achieve long-term goals more effectively.

Balance and Fairness

To avoid unfairness or bias in assessment, it is important for companies to have a clear, structured, and fair evaluation system. This is to ensure that every employee has an equal opportunity to receive incentives based on their abilities and achievements, without discrimination or imbalance.

Impact on Company Culture

Providing incentives with a merit system can help build a company culture that is oriented towards results and self-development. Employees will feel more appreciated if their efforts and achievements are well recognized, which in turn can increase their loyalty and involvement in their work [29]-[31].
Questionnaire Stage 3 (Expert Validation of Research Results)
The research results that have been obtained are then validated to experts through the stage 3 questionnaire, the expert profiles are as follows [32]-[34].

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Table 13. Research Expert Profile

No	Code	Expert name	Position	Position	Education	Work Experience
1	P1	Ir.Ilpandari, S.T.M.T.	Academic	Dean of FT and Science UNMUH Babel	Strata 2 (S-2)	15 Years
2	P2	Yayuk Apriyanti, ST.M.T	Academic	Lecturer of Civil Engineering UBB	Strata 2 (S-2)	20 Years
3	P3	M. Agus Salim, ST	PA / Owner	Head of PUPR Office of Pangkalpinang City	Strata 1 (S-1)	More than 20 Years
4	P4	Pahala R. Tobing, ST	PPK Activities	Head of Cipta Karya Division of Pangkalpinang City	Strata 1 (S-1)	More than 20 Years
5	P5	Ir. Ormuz Firdaus, S.T, M.T	DED Consultant	Team Leader	Strata 2 (S-2)	More than 20 Years
6	P6	Dr. Teddy Halim, MM	Project Manager	Director	Strata 3 (S-3)	More than 20 Years
7	P7	Lukman Hakim	Consultant	Construction Expert	Strata 1 (S-1)	More than 20 Years

Validation data obtained from the questionnaire results in the form of statements of agreement or disagreement from experts regarding alternative research solutions. The following is a table of expert validation results that have been carried out on the questionnaire stage 3 (three).

Table 19. Questionnaire Results Stage 3, Alternative Solutions Research Results

No	Variables	Alternative Solutions	Expert							Penilaian		Conclusion
			P1	P2	P3	P4	P5	P6	P7	Agree (✓)	Disagree (X)	
1	With Wages based on expertise and education level (X2.1)	Designing a skill-based pay structure allows companies to allocate human resources according to the complexity of tasks. Workers with higher skills can be given greater responsibility or more complex work, while workers with lower skills can be given simpler tasks	✓	✓	✓	✓	✓	✓	✓	7	0	Agree
2	Wages based on length of time worked (X2.2)	Wages can be combined with a performance system, which encourages workers to complete their tasks faster without sacrificing quality. This system can provide bonuses or incentives for completing work ahead of schedule, or for achieving certain targets	✓	✓	✓	✓	✓	✓	✓	7	0	Agree
3	Wages based on work performance (X2.3)	To ensure that performance-based pay can affect project completion time performance, it is important to have clear and measurable performance criteria. These criteria can be in the form of achieving work targets, quality of work results, or speed of completing tasks according to specified standards	✓	✓	✓	✓	✓	✓	✓	7	0	Agree
4	Wages in terms of specific jobs (X2.4)	Set higher wages for more complex or skilled jobs. For example, jobs that require technical expertise or rarer skills can be compensated higher. This can motivate workers to focus on more challenging and important work.	✓	✓	✓	✓	✓	✓	✓	7	0	Agree

Source: Discussion Results with Government Building Construction Project Stakeholders (2024)

CONCLUSION

The conclusions of the study are as follows: 1) based on the results of the T-Test analysis, F-Test and Determination Coefficient Test, it was obtained partially and simultaneously that Environmental Factors (X1), Wage Factors (X2), Coordination (X3), and Worker Productivity (X4) have a significant effect and have an influence contribution of 85.4% on the performance of the completion time of government building construction projects, 2) based on the results of the variable ranking analysis using multiple linear regression equations & beta coefficient values, it can be concluded that the Wage Factor variable (X2) is the dominant factor that affects the performance of the completion time of building construction projects, which is 72.59%, so to control the completion time of government building construction projects, which is mainly carried out by the Project Manager is to control Wages, 3) all research variables, namely Environmental Factors (X1), Labor Factors (X2), Coordination (X3), and Worker Productivity Factors (X4) can affect the performance of the completion time of government building construction projects in the City Pangkalpinang. The results of the analysis show that the dominant factor according to all respondents is the labor factor (beta value 1.001), according to the contractor, namely the request for changes to completed work, high rainfall and stormy winds, according to the supervisory consultant, namely labor strikes, limited use of technology and the length of equipment delivery and also according to the owner, namely labor strikes. This study adds environmental factor variables (X1) and Coordination (X3) which are proven to affect the performance of completion time on government building construction projects, 4) alternative solutions to increase the completion time on government building construction projects are carried out on the variable indicators contained in the Wage Factor (X2) as the most dominant factor.

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